Health promotion in socially vulnerable youth: sports as a powerful vehicle?

Van der Veken, Karen[1]; Willems, Sara[1], & Lauwerier, Emelien[1,2,*].

[1]Department of Public Health and Primary Care, Ghent University, Ghent

[2]Department of Experimental-Clinical and Health Psychology, Ghent University, Ghent

*Corresponding Author, Department of Public Health and Primary Care, Ghent University, Corneel Heymanslaan 10, 6K3, 9000 Ghent, Belgium, Emelien.Lauwerier@ugent.be, T+32 9 332 81 88

Abstract

Community sport has emerged in the past decades, and uses sports as a lever to improve health and wellbeing among socially disadvantaged youth. Despite this premise, we do not know whether and to what extent health promotion aims are achieved within community sports practice. Measurable actions are needed, but it can be hard for researchers or practitioners to know how to approach this. This study aimed at developing a health-promoting intervention targeting youth attending community sports. To this aim, we used a planned approach for intervention design within a community-based participatory research design. The result is a group-based program promoting health-supportive behavior among community sport coaches, as we found coaches to be quintessential in fostering motivation towards health behavior change in vulnerable youth attending community sports. The design of such a complex intervention is difficult, yet tractable, when using a planned approach. Of importance, community engagement was the core of our work and we provide the reader with detailed examples on the combined use of participatory research and planned intervention design. This paper provides an exemplar of how to approach the development of a health promoting intervention in hard-to-reach populations.

Background

Although most young people are healthy, there is still significant illness and disease suffering, and even premature death (SDG Indicators, Global Database, 2018). Mental health issues are among the most prevalent health issues in a young population. A large-scale European survey study, reporting on data from 2013-2014, shows that almost a quarter of the 11- 13-, and 15-year olds report symptoms of nervousness, sleeping problems and depressed feelings (Inchley et al., 2016). Also, many health risk behaviours, such as smoking, poor dietary habits, physical inactivity, or alcohol use develop or increase during adolescence (Alamian & Paradis, 2009; Monshouwer et al., 2012; Mitchell, Pate, Beets, & Nader, 2012; Nader, Bradley, Houts, McRitchie, & O'Brien, 2008; Ortega et al., 2013). These unhealthy behaviours likely persist into adulthood (Due et al., 2010), and may increase disease prevalence and mortality in later age (Djoussé, Driver, & Gaziano, 2009).

There are remarkable health disparities, even among young people. Young people from disadvantaged groups encounter more (chronic) health complaints (Berry, Bloom, Foley, & Palfrey, 2010; Holstein et al., 2009), mental health problems (Goldfeld & Hayes, 2012), and have increased adult morbidity and mortality rates (Chartier, Walker, & Naimark, 2010). Health promotion practice might contribute largely in reducing these health inequalities. Still, however, current health promotion programs continue to fail in reaching the more socially disadvantaged populations for a number of reasons. First, health promotion programs tend to overlook the social factors that impede health in vulnerable youth (Mohajer & Earnest, 2010). Second, they tend to address health issues as problems. Instead, empowering interventions, that are mainly designed to increase one's power to question social health norms, have proven to be more effective in promoting health within vulnerable young populations (Wilson et al., 2007). Third and last, health promotion among youth is often achieved in school contexts. However, school-based programs might not prove evenly effective for all youth. For example, anti-smoking interventions seem to work better for adolescents with a low socio-economic background when spread through informal social networks (peers) instead of through school (Mercken et al., 2012). Questions then remain on how to develop and set-up health promotion actions that are more equitable and able to address socially disadvantaged youth.

A promising strategy is to make use of community sport programs (Spaaij, Magee, & Jeanes, 2013). In Belgium, community sport initiatives were first launched in the late 1980s. Their premise is to use sports as a mean to work towards other goals, among which the goal to adopt a healthy lifestyle (Haudenhuyse, Theeboom, & Coalter, 2012). However, it is not

known whether and to what extent this aim is achieved. Measurable actions are needed, but the development of such actions is relatively new to the field of community sport. It can be hard for researchers or practitioners to know how to approach this. Therefore, the aim of the current study is to describe the development process of a health-promoting intervention targeting socially vulnerable youth within a community sports context.

Methods

Design and approach

Intervention Mapping (IM) is used as a stepwise model for designing health interventions (Bartholomew, Parcel, Kok, & Gotlieb, 2001; Bartholomew, Parcel, Kok, Gottlieb, & Fernandez, 2011). IM consists of six steps: 1) identifying community needs; 2) stating intervention aims; 3) selecting the methods and applications for behavior change; 4) constructing the program plan; 5) constructing the implementation plan; and 6) constructing the evaluation plan. The present paper focuses on intervention development, and thus steps 1-4 of the protocol. Step 1 is explained within the section 'Identifying community needs' below. A community participatory design approach (Minkler & Wallerstein, 2003) was used to progress across steps 2 to 4, and to co-create the final intervention. These steps are further explained within the section 'process of synthesis'.

Theoretical frameworks and models

There are three main theoretical approaches that we build on and that ensure strong theoretical underpinning of the intervention. These are: (a) tackling the main reasons of health (supportive) behavior using social cognitive models; (b) behavior change support using a taxonomy of behavior change techniques; and (c) supporting a logical sequence of the intervention using a theoretical process approach.

Social Cognitive Models. Key concepts from social cognitive models help to identify the determinants or reasons underlying health (supportive) behavior at stake. More specifically, we build on and combined determinants of three well-established theories of behavior change, including the Theory of Planned Behavior (TPB; Azjen, 1985), the social cognitive theory (SCT; Bandura, 1986), and the Transtheoretical model of behavior change (TTM; Prochaska & DiClemente, 1983). The TPB postulates human behavior to be governed by one's personal attitudes, namely how one rationally thinks about the behavior and its

favorability. TPB also assumes the individual to be affected by their perceived behavioral control, or what they think and believe their ability is to actually perform or engage in health behaviors. This element of perceived behavioral control is much more advanced within the SCT. Central within this theory is the concept of self-efficacy, referring to one's confidence in overcoming barriers. SCT predicts individuals to engage in behavior when knowing how to engage, valuing the outcomes of engaging in the behavior, and being confident that they will be able to overcome barriers. TTM assumes individuals move through a series of stages when modifying behavior. Earlier stages require knowledge and attitude building, while individuals in later stages need to build self-confidence and acquire skills to engage into behavior and overcome barriers.

Taxonomy of Behaviour Change Methods. We adopted the taxonomy on behavior change methods as presented in the IM protocol (Bartholomew et al., 2011). This taxonomy aids the selection of methods that have the best potential to change one or more determinants of behavior of the target group.

Health Action Process Approach. It is important to ensure that the final intervention is planned in a logical way so that it increases the chance of being adopted. To maximize the likelihood of adoption, we applied principles of the Health Action Process Approach (HAPA; Schwarzer, 2008) to guide decisions on the sequences in which the intervention elements are delivered. There is the idea that when engaging in new behavior, people move from motivation to volition. Therefore, the intervention should first ensure that people get motivated and develop an intention to change behavior. Then, people should be assisted to translate their intention into actions. The logical sequence of an intervention should therefore parallel these stages of behavior change.

Identifying community needs

Identifying target user's needs and preferences for an intervention is an essential first step towards intervention development (Bartholomew et al., 2011). Our goal was to dissect the views of community sport coaches regarding youngsters' health behavior and how to approach them. Data were obtained as part of a larger research project CATCH (Community Sport for AT-risk youth: innovative strategies for promoting personal development, health, and social cohesion. This 4-year (2016-2019) multi-centric research project aims at examining the mechanisms and context factors of how community sports may impact personal development, health and social cohesion. Street soccer teams from three small to medium

Flemish cities targeting youngsters and adults in homeless situations were observed and we gathered data from training moments, leisure moments, teambuilding activities, staff meetings and national and local tournaments. Also, semi-structured interviews were performed with coordinators, coaches and social partners (N=22) as well as participants (N=10). Partners ranged from social workers, youth workers, centers for social welfare to drug rehabilitation centers and homeless shelters. Lastly, two focus group interviews with coordinators, coaches and partners (respectively N=6; N=7) were held.

Ethics. All study participants provided informed consent after verbal and written information. The Ethics Committee of Ghent University Hospital approved the study (reference number: 2016/0606).

Data analysis. We applied the method of grounded theory (Glaser & Strauss, 1967) involving the systematic development of a theory or agglomerate of interrelated concepts. Data were collected iteratively, sourcing from (participatory) observations and semi-structured interviews. Consecutive focus groups served to validate the data obtained. Data were generated and analyzed using the constant comparative method of grounded theory (Glaser & Strauss, 1967). Two researchers independently read transcripts. Open coding was carried out and themes were extracted. Supposed determinants of risk-related health behavior were defined in separate nodes/themes and then grouped into overall categories and finally organized in a preliminary theory. Themes extracted from focus group data served to validate our findings and decide on gaps, contradictions and uncertainties in the preliminary theory.

Process of synthesis

We synthesized the data and decided on the final intervention using an iterative participatory design approach following the aforementioned steps of the IM protocol (steps 2 to 4). Step 1 of the IM protocol is tackled in the section above. Below, steps 2 to 4 are explained in more detail.

Stating intervention aims (step 2). Step two of IM determines the goals for the intervention, specifying what the target population has to do or change as a result of the intervention. The research upon which the intervention development draws was conducted through a Flemish case study. The case, a community sport initiative from a medium, regional Flemish city other than the ones studied within step 1, was selected from a full range of community sport practices in Flanders due to its interest and rather implicit attention to the role of community sport as a vehicle for health promotion. The initiative provides open-air activities within six neighbourhoods that are primarily focused on young children and teenagers from unprivileged

and often poor areas. The initiative is run on a daily basis by two main coordinators and a varying number of community sport coaches, up to a total of 6 or 8. The majority of the coaches are BOP practitioners (Buurtsportwerkers in Opleiding – Community Sport Practitioners in Training). BOP practitioners follow an employment and education trajectory, with the ultimate goal of vast employment after training. Their profile is characterized by several vulnerabilities, among which longer-term unemployment, disruptive childhoods, school dropout, poverty, financial debts, problematic substance use (e.g., alcohol, drugs), poor housing, major psychological problems (e.g., depression, psychosis), and/or language issues. The education trajectory they follow is met through short-term training courses and/or longer-term courses by for instance obtaining a high school or Bachelor degree. An intervention aimed at increasing healthy living among vulnerable youngsters fitted the mission and aims of the community initiative as it may further train BOP practitioners in achieving social skills. A core team consisting of two researchers (KVDV, EL) and two community coach coordinators (LG, RS) synthesized the information to be covered in tangible intervention aims. Coordinators were both well aware of the needs and preferences of the target users and target population with the intervention, while preserving a necessary broad scope on the intervention targets and aims. The intervention aims were based on the knowledge as obtained in step 1. This knowledge was complemented with evidence base (as outlined within the theory of youth mentoring by Pawson in 2006). When stated too broadly, intervention aims were broken down into sub-aims or reflections of the actions that target users should be able to perform after the intervention. Next, the main determinants or reasons behind the actions were synthesized, again based on the knowledge of step 1 as well as evidence-based theories (represented by social cognitive models as outlined within the section theoretical framework and models). Finally, the measurable outcomes in terms of behavior and determinants that we wanted to observe in coaches as a result of the intervention ("*change goals*") were defined.

Selecting the methods and applications for behavior change (step 3). The objective of step 3 within IM is to generate the core of the program. The main idea behind this step is to link the change goals to effective *methods*, and to translate these into practical *applications*. Methods are theory-based and consist of techniques that have been shown to be able to change one or more determinants of behavior (Abraham & Michie, 2008; Bartholomew et al., 2011). An application is a translation of a method in a way that their use fits the target population for the intervention, and the context in which the intervention will run (Bartholomew et al., 2011). A brainstorm was held by a core team of researchers and community members (see above) and

preliminary ideas for methods were collected. These were complemented with current evidence on effective behavior change methods from existing taxonomies (Bartholomew et al., 2011; Kok et al., 2016). Behavior change methods are general techniques or processes that have been shown to be able to change one or more determinants of behavior of an at-risk group or of environmental agents. Taxonomies summarize the evidence for a method regarding effective behavior change based on several behavioral and/or social science theories (Abraham & Michie, 2008). Within these taxonomies, general methods are described for influencing several different determinants. Also, methods are outlined that serve to influence specific determinants, such as there are methods for influencing attitude (e.g., self-reevaluation, direct experience, etc.), methods for influencing self-efficacy (e.g., guided practice, verbal persuasion, etc.), etc. Also, taxonomies describe the parameters that have to be met in order for methods to be effective in specific populations and environments. These parameters help to translate the theory-based methods to practical applications in order to reach optimal fit (Bartholomew et al., 2011; Kok et al., 2016). Behavior change methods were decided on by the researchers of the participatory design group because of expertise and experience with this selection process. These methods were then reviewed and agreed upon by the entire group. Next, the group translated methods into applications taking into account attractiveness and relevance to community coaches.

Constructing the program plan (step 4). The main aim of step 4 is to build the intervention in terms of content, scope and sequence, making use of the methods and applications selected in step 3. The HAPA model (Schwarzer et al., 2008), explaining human behavior change to transition from motivation (e.g., “Do I want to perform this behavior”) to volition (“How do I succeed in translating my intention to change my behavior into action?”), was taken as a backbone for constructing the intervention sequence. The final intervention was drafted through iterative brainstorm and discussion among the members of the participatory design group. The applications of step 3 were taken as a starting point. We were also able to integrate material from other training curricula (e.g., videos, teasers, assessments) that shared some topics or themes. Iterations of the content were discussed and refined by the participatory design group. Evaluation included whether it met the needs of the community, how it was presented, the design of the training and material (e.g. hand-outs, assessments, etc.). This on-going involvement meant that the participatory design group shaped the entire intervention

Results

Step 1: Identifying community needs

Determinants of risk-related health behavior were identified at two levels: the individual and environmental level. Individual level determinants included (i) 'self-awareness', (ii) 'sense of safety', (iii) 'self-confidence', and (iv) 'sense of belonging'. 'Self-awareness' referred to youth being knowledgeable regarding own risk-related health behavior. 'Sense of safety' referred to youth feeling recognized, understood, and accepted as a person. 'Self-confidence' referred to building up success experiences by pushing physical and mental limits through community sport activities. Increased self-efficacy was reported to create openness in discussing health-related problems, and to promote healthy behavior, also outside the community sports context. These latter two determinants were also interrelated. A low sense of safety was related to low self-confidence, and hence being more prone to risk-related health behavior. Finally, 'sense of belonging' related to the sense of feeling noticed and known by peers and community sport coaches. When sense of belonging was high, youth expressed to feel accepted and being given an equal chance to develop personally and to live healthily regardless of sportive capabilities. 'Environmental-level' determinants included (i) 'a safe and trustworthy environment', (ii) 'a positive coaching climate', (iii) 'group dynamics', and (iv) 'a climate that facilitates health-promoting behavior'. 'A safe and trustworthy environment' referred to the availability and accessibility of the coach to openly discuss (health-related) problems. 'A positive coaching climate' was described in various ways: coaches acting as mentors, allowing to learn from mistakes, encouraging to take up roles and responsibility, supporting in setting health and developmental goals. 'Group dynamics' consisted of a positive and stimulating group climate and cohesion between members of the group. This was reported to lead to a greater sense of belonging, and to lead to higher participation and more healthy behavior in its own right. Lastly, 'a climate that facilitated health-promoting behavior' was expressed in ways such as sharing good times over a healthy snack or the provision of fruit and water during sports, and role modeling of coaches and respected peers (e.g., the coach demonstrating how healthy eating may link to sport performance and healthy living as a whole).

Step 2: Stating intervention aims

In line with the mission and aims of the community initiative (see above), the participatory design group decided on an intervention targeting environmental determinants. More specifically, it was decided that a later intervention should aim at creating a health-supportive

environment through the coaches' behavior. Based on the knowledge of the previous step, intended behavioral actions should relate to four important broad themes, namely safety and trustworthiness, positive coaching, group dynamics, and facilitation of health promotion by adapting the context of the community initiative. A total of 24 "actions" was selected. For a detailed overview see Table 1. Determinants addressed included: awareness/knowledge, attitude, self-efficacy, and skills. Examples of measurable change goals include: coaches (…) (1) (…) are aware that stimulating roles and responsibility is important for youth to increase sense of belonging motivating them to participate in health-promoting actions *(awareness/knowledge)*; (2) (…) express advantages of acting as a role model regarding healthy behavior *(attitude)*; (3) (…) express confidence that they can be a role model during community sport initiatives (e.g. no smoking, healthy snacking, acting relaxed, sufficient sleep) *(self-efficacy)*; (4) (…) show skills in providing a health-promoting climate (e.g. through the provision of healthy snacks, etc.) *(skills)*. For reasons of readability, we cannot provide the extensive list of change goals here. It can be obtained from the authors on request.

Step 3: Selecting the methods and applications for behavior change

The methods to promote knowledge and self-awareness include providing information about the problem or confrontation about the causes, consequences, or alternatives for a problem; visual aids; and guided learning (Bartholomew et al., 2001). Attitude change was promoted through experience-based methods such as direct experience (shifting one's attitude through the interpretation of own experiences), self-reevaluation and environmental reevaluation (shifting one's image of own behavior through encouragement in seeing one's behavior with regard to either one's self-image or in relation to one's social environment), and modeling (changing opinions and ideas by providing an acceptable model that is being reinforced for the new behavior) (Bartholomew et al., 2001). Self-efficacy capacity and skills were enhanced mainly through methods suggested by the Social Cognitive Theory of Bandura (Bandura, 1986) such as:

- Self-monitoring, goal setting, action planning and feedback: guiding and providing techniques that help individuals in reaching goals
- Modeling of behaviors: providing an appropriate role model that is being reinforced for the desired behavior
- Problem-solving: prompting to list possible barriers and ways to overcome these

- Discussion and elaboration: changing the way one thinks about the problems and ways to overcome it
- Direct experience and active learning: assuring engagement and decision-making and ensuring learning from own experiences
- Verbal persuasion: messages from credible sources (e.g. coordinators, experts) suggesting one possesses certain capabilities

Table 2 presents the methods used and how they were translated into applications.

Step 4: Constructing the program plan

The program was designed as interactive and fun, delivered clear messages about health promotion and skill building, and included target group appropriate methods. It was designed as a group-coaching program, though individual guidance and feedback were built in. The intervention was spread over a period of several months, in order to create opportunities for the coaches to bond with each other and the participatory design group.

The building blocks of the intervention consisted of ten 4-hour group sessions and several 1-hour individual sessions at the beginning, at the end and in between group sessions. Each group session followed the same structure being (1) reflection on past sessions, (2) delivery of new content, (3) exercises and/or skill building, and (4) closure w/without take-home activities. The 4-hour sessions were organized at a slow pace with an energizing (e.g. 7-minute work-out) or calming-down (e.g. meditation moment) break at least twice per session.

Table 3 illustrates the breath and amount of content during the intervention (scope) and the order in which the content was delivered (sequence).

In the first four group sessions emphasis was put on creating a safe environment and a bond of trust. Although the coaches were already acquainted before, they had never worked together around topics as personal as the ones delivered during the intervention. In addition, in this first series of sessions, we used methods and techniques to raise awareness on health, lifestyle, and the merits of health promotion among youth attending community sports. Through open debates, self-reflection, the provision of evidence-based health information, and exercises through the course of the sessions, coaches were encouraged to raise their consciousness on the advantages of healthy living, and obstacles to act healthily.

During the two following individual sessions with a job coach/mentor, coaches were encouraged to discuss their health status, to think of ways to improve their health and lifestyle

and to convert these ideas into personal health goals (e.g., with regard to exercise, healthy diet, rest and relaxation, sleep hygiene, tobacco or alcohol use). A personal action plan was developed with each individual, and individual progress was tracked during the following individual session.

Later group sessions, which focused on attitude shifting, self-efficacy and skill building, aimed at encouraging coaches to discuss health-promoting behavior and helped them to build skills and apply health-promoting actions during community sports activities. During this series of group sessions, methods included were obviously different. We made use of direct experience, self-reevaluation, modelling and other attitudinal experience-based methods. Self-efficacy and skill building were influenced by methods such as goal setting, action planning, guided practice, verbal persuasion, and modelling, among others.

Two reflective observation exercises interspersed the series of group sessions, and aimed at providing coaches with a good example of applying the skills in practice.

At the end of the series of group sessions, coaches were encouraged to prepare and organize a community activity while being asked to apply as many of the skills learned in order to promote participation and healthy living among youth attending the activity. Immediate constructive feedback was provided.

Lastly, a job coach spent at least one follow-up individual session discussing the coaches' own progress regarding living healthy, as well as their concerns or problems in applying skills to promote health among youth attending community sport activities.

Discussion

Our study focused on the systematic development of a health promoting intervention for socially vulnerable youth within a community sports context using the IM protocol. The IM protocol proposes different steps to intervention development, and we describe these steps combined with a participatory design approach. The current paper describes the development process of an intervention, which is particularly important in the field of intervention design for health promotion where the development and content of such interventions is rarely described (Michie, Fixsen, Grimshaw, & Eccles, 2009). This is especially important for interventions aimed at being enrolled within a community sport context, as no such examples exist yet. Our analysis of the needs of target users within a community sport context showed that both individual-level as well as environmental-level determinants were associated with

risky health behavior among youth. The participatory design group decided on an environmental-level intervention in line with the vision and aims of the community initiative that provided the research context of the current study. The general aim of the intervention was to increase health-promoting behavior of community sport coaches. A group coaching program was developed covering themes as self-awareness of one's role as a community sport coach and as a model promoting healthy living, motivational coaching and communication regarding health and well-being goals, and facilitating positive group dynamics and a healthy climate.

There are at least three major findings that deserve further attention. First, we began this paper with the question whether sports may be a powerful vehicle in promoting health among socially vulnerable youth. We found that community sports may nurture self-awareness, self-efficacy beliefs, and a sense of relatedness, important determinants of healthy choices among youth. Coaches may provide the necessary conditions to support and nurture such choices. Mackenzie and Stoljar (2000) describe this as 'relational autonomy', stating that health agency develops in relation to the environment, for instance through valuable social and interpersonal relationships. This idea is also in line with the 'empowerment view' on health promotion (Mohajer & Earnest, 2009; Wardrope, 2015). Second, our community needs analysis pointed at the influence of different levels of determinants on health behavior, both individual as well as environmental determinants. This finding fits an ecological conceptual model on health promotion, assuming that both individual factors, various levels of environmental factors, and the interaction between these different levels impact health behavior and outcomes (Crosby & Noar, 2010; Kok, Gottlieb, Panne, & Smerecnik, 2012). Our micro-level intervention may very well complement individual approaches already existing in public health practice, namely the provision of health education, support, and so forth. Third, it is a particular strength that our approach to intervention development included participatory design methods. A participatory design group, consisting of both researchers and community stakeholders, determined the content and design of the intervention. This makes the designed program practice-driven, referring to continuous participation of and reflection with local stakeholders about the program scope, content and delivery modes, as well as theory-driven, referring to the systematic step-wised approach and selection of theory-based determinants and methods for the intervention. Our participatory design approach clearly adds to the general validity of the study, however, it also comes with challenges because community involvement is of course a complex endeavor (see also, Spaaij et al., 2018). It requires *continuous* collaborative efforts between academics and community partners, while

recognizing the strengths of each and allowing for shared leadership and decision-making (Minkler & Wallerstein, 2003). The participatory approach described in this paper is however a good starting point and might allow researchers and practitioners to build further on the ideas and cumulate knowledge and good practice.

Our study has a few strengths, yet each comes with a possible shortcoming. First, our contextual analysis has clear validity within our studied community context(s), but we are not sure whether the same findings hold in other groups as well. We believe, however, to have added to the field by exploring the evidence on factors impacting health in a group that is difficult to reach. Qualitative assessment in other groups and contexts is still needed. At least, the IM protocol may be used as a checklist to gain understanding on health issues and related influencing factors in other groups as well. Second, our coach program may complement standard individual-level prevention efforts in promoting youth's health. Nevertheless, there are other social and physical environmental factors that were not addressed in the program. Future intervention studies need to take into account these multiple levels of influence simultaneously in order to have maximum impact of health promotion. Third and last, in this paper we addressed issues related to the design of an intervention. Results regarding implementation and impact of the intervention will be published elsewhere, whenever available. However, health promotion practice can only be advanced if the development of interventions and their content are sufficiently described (Abraham & Michie, 2004). Our approach, using the combination of IM and participatory design methods, may be exemplary and may offer researchers and health promotion practitioners with necessary details if wanting to develop health promotion intervention within community sports in the future. The explicit use of theory was essential, with TPB (Azjen, 1985), SCT (Bandura, 1986), and TTM (Prochaska & DiClemente, 1983) to inform the intervention aims; a taxonomy of Bartholomew et al. (2011) to guide specific methods for behavior change; and the Health Action Process Approach (Schwarzer, 2008) to provide the logical sequence of the intervention. We hope by describing the development process and content of the intervention, we will further research in the field. By detailed reporting of the intervention elements, mechanisms and approach, we hope to act as an exemplar for researchers and practitioners that aim to build health-promoting interventions to improve adolescent health within the domain of community sport. Once properly described, researchers and practitioners may make choices of how to adapt an intervention, while preserving its essential working elements. Bowing on well-described examples is helpful in a context of limited time and money for development.

Conclusions

Our study showed that community sports may be a powerful vehicle to deliver empowering, health-promoting programs in socially vulnerable youth that are not easily reached through standard prevention measures. Our combined use of IM and participatory design methods shows to be fruitful in developing a theory-driven yet culturally sensitive intervention. As effective intervention design remains a complex endeavor, the use of a participatory design approach may appear to be quintessential in increasing chances that target users accept and adopt actions, and maintain these over time. This paper adds to the literature in providing principles to integrate participatory design methods into an existing planning approach in order to create an acceptable intervention in the field of health promotion.

References

1. Abraham C., & Michie S. (2008). A taxonomy of behavior change techniques used in interventions. *Health Psychology: Official Journal of the Division of Health Psychology, American Psychological Association, 3*, 379–387. https://doi.org/10.1037/0278-6133.27.3.379
2. Ajzen, I. (1985). From intentions to action: A theory of planned behavior. In J. Kuhl & J. Beckman (Eds.), *Action control: From cognitions to behaviors* (pp. 11-39). New York, NY: Springer.
3. Alamian, A., & Paradis, G. (2009). Clustering of chronic disease behavioral risk factors in Canadian children and adolescents. *Preventative Medicine*, *48*, 493–499. https://doi.org/10.1016/j.ypmed.2012.03.014
4. Bandura, A. (1986). *Social foundations of thought and action: a social cognitive theory*. Englewood Cliffs, N.J.: Prentice-Hall.
5. Bartholomew, L. K., Parcel, G. S., Kok, G., & Gottlieb, N. H. (2001). *Intervention mapping: Designing theory and evidence-based health promotion programs*. Mountain View, CA: Mayfield Publishing.
6. Bartholomew, L. K., Parcel, G. S., Kok, G., Gottlieb, N. H., & Fernández, M. E. (2011). *Planning health promotion programs: An intervention mapping approach*. 3rd ed. San Francisco, CA: Jossey-Bass.
7. Berry, J.G., Bloom, S., Foley, S., & Palfrey, J.S. (2010). Health inequity in children and youth with chronic health conditions. *Pediatrics, 126* (3), 111–119. https://doi.org/ 10.1542/peds.2010-1466D
8. Chartier, M.J., Walker, J.R., & Naimark, B. (2010). Separate and cumulative effects of adverse childhood experiences in predicting adult health and health care utilization. *Child Abuse Neglect,* 34, 454–464. https://doi/org/ 10.1016/j.chiabu.2009.09.020
9. Crosby, R., & Noar, S.M. (2010). Theory development in health promotion: Are we there yet? *Journal of Behavioral Medicine, 33*, 259-263. https://doi.org/10.1007/s10865-010-9260-1
10. Djoussé, L., Driver, J.A., & Gaziano, J.M. (2009). Relation between modifiable lifestyle factors and lifetime risk of heart failure. *The Journal of the American Medical Association*, *302*, 394–400. https://doi.org/ 10.1001/jama.2009.1062

11. Due, P., Krolner, R., Rasmussen, M., Andersen, A., Damsgaard, M.T., Graham, H., & Holstein, B.E. (2011). Pathways and mechanisms in adolescence contribute to adult health inequalities. *Scandinavian Journal of Public Health*, *39* (6), 62-78. https://doi.org/10.1177/1403494810395989
12. Glaser, B. & Strauss, A. (1967). *The discovery of grounded theory. Strategies for qualitative research*. Chicago: Aldine Publishing Company.
13. Goldfeld, S.R., & Hayes, L. (2012). Factors influencing child mental health: a state-wide survey of Victorian children. *Journal of Paediatrics and Child Health, 48*, 1065–1070. https://doi.org/10.1111/j.1440-1754.2012.02473.x
14. Haudenhuyse, R., Theeboom, M., & Coalter, F. (2012). The potential of sports-based social interventions for vulnerable youth: Implications for sport coaches and youth workers. *Journal of Youth Studies, 15*(4), 437-454. https://doi.org/10.1080/13676261.2012.663895
15. Holstein, B.E., Currie, C., Boyce, W., Damsgaard, M.T., Gobina, I., Kökönyei, G., …, HSBC Social Inequalities Focus Group. (2009). Socio-economic inequality in multiple health complaints among adolescents: international comparative study in 37 countries. *International Journal of Public Health, 54*, 260-270. https://doi.org/ 10.1007/s00038-009-5418-4
16. Inchley, J., Currie, D., Young, T., Samdal, O., Torsheim, T., Augustson, L., …, Barnekow, V. (2016). Growing up unequal: gender and socioeconomic differences in young people's health and well-being. Health behavior in school-aged children (HBSC) study. International report from the 2013/2014 survey. Copenhagen: WHO Regional Office for Europe (Health Policy for Children and Adolescents, No. 7. Retrieved from: http://www.euro.who.int/__data/assets/pdf_file/0003/303438/HSBC-No.7-Growing-up-unequal-Full-Report.pdf?ua=1.
17. Kok, G., Gottlieb, N.H., Panne, R., & Smerecnik, C. (2012). Methods for environmental change; an exploratory study. *BMC Public Health, 12*, 1037. https://doi.org/10.1186/1471-2458-12-1037
18. Kok, G., Gottlieb, N.H., Peters, G-J. Y., Mullen, P.D., Parcel, G.S., Ruiter, R.A.C., …, Bartholomew, L.K. (2016). A taxonomy of behavour change methods: an Intervention Mapping approach. *Health Psychology Review, 2*, 297-312. https://doi.org/ 10.1080/17437199.2015.1077155
19. Mackenzie, C., & Stoljar, N. (2000). *Relational autonomy: Feminist perspectives on autonomy, agency, and the social self*. Oxford: Oxford University Press.

20. Mercken, L., Moore, L., Crone, M.R., De Vries, H., De Bourdheaudhuij, I., Lien, N., …, Van Lenthe, F.J. (2012). The effectiveness of school-based smoking prevention interventions among low- and high-SES European teenagers. *Health Education Research*, *27* (3), 459-469. https://doi/org/ 10.1093/her/cys017
21. Michie, S., Fixsen, D., Grimshaw, J. M., & Eccles, M. P. (2009). Specifying and reporting complex behaviour change interventions: the need for a scientific method. *Implementation Science, 4*, 40. https://doi.org/10.1186/1748 -5908-4-40
22. Minkler, M., & Wallerstein, N. (Eds.). (2003). Community based participatory research for health. San Francisco, CA, US: Jossey-Bass.
23. Mitchell, J., Pate, R., Beets, M., & Nader, P. (2012). Time spent in sedentary behavior and changes in childhood BMI: a longitudinal study from ages 9 to 15 years. *International Journal of Obesity*, *37*, 54–60. https://doi.org/ 10.1038/ijo.2012.41
24. Mohajer N, & Earnest J. (2009). Youth empowerment for the most vulnerable: a model based on the pedagogy of Freire and experiences in the field. *Health Education, 109*, 428–38. https://doi.org/ 10.1108/09654280910984834
25. Monshouwer, K., Harakeh, Z., Lugtig, P., Huizink, A., Creemers, H.E., Reijneveld, S.A., …, Vollebergh, W.A.M. (2012). Predicting transitions in low and high levels of risk behavior from early to middle adolescence: the TRAILS study. *Journal of Abnormal Child Psychology*, *40*, 923–931. https://doi.org/ 10.1007/s10802-012-9624-9
26. Nader, P.R., Bradley, R.H., Houts, R.M., McRitchie, S.L., & O'Brien, M. (2008). Moderate-to-vigorous physical activity from ages 9 to 15 years. *The Journal of the American Medical Association*, *300*, 295–305. https://doi.org/ 10.1001/jama.300.3.295
27. Ortega, F.B., Konstabel, K., Pasquali, E., Ruiz, J.R., Hurtig-Wennlöf, A., Mäestu, J., …, Sjaström, M. (2013). Objectively measured physical activity and sedentary time during childhood, adolescence and young adulthood: a cohort study. *PLoS One, 8 (4),* e60871. https://doi.org/10.1371/journal.pone.0060871
28. Pawson, R. (2006). *Evidence-based policy. A realist perspective*. Sage Publications: London.
29. Prochaska, J.O., & DiClemente, C.C. (1983). Stages and processes of self-change of smoking: toward an integrative model of change. *Journal of Consulting and Clinical Psychology*, *51*:390-395.

30. Schwarzer, R. (2008). Modeling health behavior change: How to predict and modify the adoption and maintenance of health behaviors. Applied Psychology: An International Review, 57(1), 1-29. https://doi: 10.1111/j.1464-0597.2007.00325.x
31. Spaaij, R., Magee, J., & Jeanes, R. (2013). Urban Youth, Worklessness and Sport: A comparison of Sports-Based Employability Programmes in Rotterdam and Stoke-on-Trent. *Urban Studies, 50(8)*, 1608-1624. https://doi.org/10.1177/0042098012465132
32. Spaaij, R., Schulenkorf, N., Jeanes, R., & Oxford, S. (2018). Participatory research in sport-for-development: Complexities, experiences and (missed) opportunities. *Sport Management Review, 21*, 25-37. https://doi.org/10.1016/j.smr.2017.05.003
33. Wardrope, A. (2015). Relational autonomy and the ethics of health promotion. *Public Health Ethics, 8*, 50-62. https://doi.org/ 10.1093/phe/phu025
34. Wilson, N., Dasho, S., Martin, A.C., Wallerstein, N., Wang, C.C., & Minkler, M. (2007). Engaging young adolescents in social action through photovoice: the Youth Empowerment Strategies (YES!) project. Journal of Early Adolescence, 27, 241–261. https://doi.org/10.1177/0272431606294834

571 **Table 1. List of health-supporting actions formulated for the intervention**

Creating a safe and trustworthy environment
1.1 Coaches stimulate participants to get to know one another and the coach
1.2 Coaches gain insight into the living environment of participants
1.3 Coaches create a bond of trust with participants
1.4 Coaches communicate proactively on expectations and tasks
1.5 Coaches organize their sessions in a structured manner and make use of rituals created by the group
1.6 Coaches offer sport and healthy activities that are perceived as fun
1.7 Coaches make use of games to promote sports and health behavior
1.8 Coaches expose participants to various forms of sports and health-promoting activities
Assisting youths in a positive manner regarding participation in sports and health promoting activities
2.1 Coaches stimulate participants to identify strengths within themselves
2.2 Coaches refer to and focus on strengths of participants (and do not compare individuals)
2.3 Coaches are task-oriented and prioritize efforts over results
2.4 Coaches allow mistakes made by others and themselves and motivate (others or themselves) to learn from those mistakes
2.5 Coaches give feedback in a constructive manner (formulation, body language…)
2.6 Coaches are able to listen and to have two-way communication
Enhancing group identity regarding participation in sports and health promoting activities
3.1 Coaches help to create and regularly refer to a common goal
3.2 Coaches emphasize/visualize the group identity wherever possible
3.3 Coaches stimulate constructive role distribution within the group (and actively change it when trusted)
3.4 Coaches identify sources of conflict timely and are able to prevent escalation of conflict
Promoting and enabling positive health behavior by setting examples
4.1 Coaches reflect on their level of health promoting behavior and set self-goals
4.2 Coaches promote a sense of self-reflection among participants regarding their health promoting behavior in accordance with their values, loyalties and ambitions
4.3 Coaches act as a role model regarding various aspects of health promoting behavior
4.4 Coaches expose participants to different health choices
4.5 Coaches inform on the offer of tools, instances and possibilities outside the sport plus program regarding sports and health behavior
4.6 Coaches discuss referral to specialized instances whenever youths express problems regarding health and well being and upon request

572 **Table 2.**

573 **Linking behavioral determinants, methods, and applications**

Behavioral determinants	**Methods**	**Applications**
Knowledge and Awareness	Advance organizers	Written and visual information in printed session notes for coaches In-session notes on flip-over Structured group sessions
	Consciousness Raising Persuasive communication Discussion	Through awareness exercises, based on brainstorm, discussions, and small assignments in between sessions, coaches learn to identify (own) risky lifestyle behaviour(s)
Attitudes	Direct experience Self-re-evaluation Environmental re-evaluation Elaboration	Through awareness exercises, based on brainstorm and discussion moments and fun and entertaining (sport and exercise) activities, coaches learn to identify current beliefs on health, their lifestyle and the problems they might face in (later) life as well as in social interactions.
	Modelling	Coaches and peers share examples on health, lifestyle, and problems they might face in (later) life
Self-efficacy and Skills	Active Learning Direct Experience	Interactive sessions that encourage coaches to search for answers themselves instead of passive learning and listening.
	Individualization Tailoring	Before the start of the group sessions, coaches have a personal conversation with researchers

		w/without a confidential person in order to speak openly about their views on health and current lifestyle behaviour, as well as the way they promote health among youth attending the community sport activities. During the course of the intervention, individual sessions are planned with their jobcoach/mentor in which coaches can ask about their personal concerns and problems regarding their health and lifestyle, and individual progress is tracked.
	Self-monitoring of behaviour Goal setting Guided practice Planning coping responses Feedback Verbal persuasion Provide contingent awards Providing reinforcement	Coaches learn to identify their ambitions and values regarding health, and learn to formulate desired goals and outcomes. This is achieved through individual sessions during the course of the intervention. In addition, skills regarding health-promotion among youth are being actively practised during group sessions, and coaches are given feedback, as well as are encouraged, motivated and self-awarded to find solutions for problems and how to handle these.
	Modelling	Role models of other community sport activities talk about their experiences with group dynamics and positive coaching and this impacts health of youth. In addition, coaches are encouraged to observe other coaches at work.

	Facilitation	During group sessions, healthy living is promoted and visible in various ways (e.g., sport or exercise during break, healthy snacks and drinking, etc.).

578 **Table 3.**

579 **Scope and sequence of the intervention**

580

	Delivery mode	***Session Theme***	***Content***
*	Individual	Personal acquaintance	- Views on health and healthy living - Views on health-supporting behavior among youth
1	Group	Acquaintance with the group	- Getting to know each other through fun exercise activities - Overview of the program - Objectives of the program - Expectations of participants - Discussion of program rules - Speed dates to get to know each other's motivation and drives - Take-home activity on motivation and ambitions
2	Group	Getting to know the (theory behind) the program	- Reflection on past session and take-home activity - Creation of a theory-of-change on how to promote participation and health among youth attending community sport activities - Discussion of recurrent topics of the program (e.g., unconditionality, positive coaching, positive group climate, etc.)
3	Group	Guided visit to a national community sports initiative	- Getting to know the initiative and common grounds with own practice - Getting to know the target population and neighborhood
4	Group	Sports and healthy living	- Reflection on past sessions - Brainstorm and discussion of different themes, such as physical activity and sports, healthy eating, caffeine and energy drinks, and smoking and drug

			abuse - Take-home activity on self-reflection of own health behavior
*	Individual	Personal health objectives	- Reflection on past group sessions - Discussion of own health behavior - Development of personal action plan
*	Individual	Follow-up session personal health objectives	- Reflection on past successes or problems - Follow-up on personal action plan
5	Group	Motivating youth: what and how?	- Reflection on past sessions - Information on the why and how of positive coaching - Exercises to apply positive coaching to community sports in order to promote participation and health among youth - Take-home activity on positive coaching
6	Group	Communication in practice	- Reflection on past session and take-home activity - Information on empathic communicative skills (e.g., listening, affirmation, asking questions, etc.) - Exercises to apply communication to community sports in order to promote participation and health among youth - Take-home activity on communication
*	Individual	Reflective observation exercise	- Learning about the application of positive coaching and communication - Learning by observing a peer
7	Group	Group dynamics	- Reflection on past session and take-home activity - Information on group and group formation, why to use group dynamics to promote individual participation and health, and group conflict - Exercises to apply knowledge on group and group formation and conflict handling in order to promote participation and health among youth

			- Take-home activity on group dynamics
8	Group	How to create and stimulate group dynamics	- Reflection on past session and take-home activity - Information on methods and techniques to enhance a positive group climate - Exercises to apply methods in order to promote participation and health among youth - Take-home activity on group climate
*	Individual	Reflective observation exercise	- Learning about the application of positive coaching, communication and group dynamics - Learning by observing a sport coach
9	Group	Dealing with developmental/behavioral difficulties in youth	- Information on behavioral difficulties due to contextual factors, and developmental problems - Information on influencing factors of behavioral difficulties - Exercises to apply good practices in dealing with behavioral difficulties during community sport activities
*	Group	Community sports activity organized and animated by coaches-in-training	- Organization of activity in different groups of socially vulnerable youth, followed by immediate feedback
10	Group	General reflection	- Reflective exercises on own risky health behavior, group dynamics, and progression and/or obstacles concerning health supportive behavior throughout the course of the program
*	Individual	Follow-up session personal health objectives and program	- Reflection on program and potential concerns or problems - Follow-up on personal action plan

581

582

583